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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,259	10/06/2003	Satoshi Maemori	2003_1422	3451

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EXAMINER	
WALKE, AMANDA C	

ART UNIT	PAPER NUMBER
1752	

DATE MAILED: 03/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No.	Applicant(s)	
	10/678,259	MAEMORI ET AL.	
	Examiner	Art Unit	
	Amanda C Walke	1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/939,842.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/6/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. This application appears to be a division of Application No. 09/939842, filed 8/21/2001. A later application for a distinct or independent invention, carved out of a pending application and disclosing and claiming only subject matter disclosed in an earlier or parent application is known as a divisional application or "division." The divisional application should set forth only that portion of the earlier disclosure which is germane to the invention as claimed in the divisional application.

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/939842, filed on 8/21/2001.

Specification

3. The disclosure is objected to because of the following informalities: On page 8, line 15, "2-methyladan**a**ntyl" should be "2-methyladam**m**antyl".

Appropriate correction is required.

4. The disclosure is objected to because of the following informalities: On page 22, in Table 1 in the "Comparative Example 2", line, "0,17" should be "0.17".

Appropriate correction is required.

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Nitta et al (5,945,517).

Nitta et al disclose a chemically amplified photoresist composition having advantages in contrast and resolution of patterning, photosensitivity, high film thickness retention, and cross sectional image profile, as well as stability of the latent image formed by the pattern-wise exposure to light before the post-baking treatment (abstract, column 1, lines 10-34, and column 2, lines 35-49). This composition comprises a film forming resin component and a radiation sensitive acid-generating component. The resin component is preferably a polyhydroxystyrene resin that is substituted by tert-butoxycarbonyl or alkoxyalkyl groups for 10-50 %, preferably 15-40 % of the hydroxyl groups, and a second polyhydroxystyrene resin that is substituted by alkoxyalkyl groups (such as ethoxyethyl and methoxy-n-propyl groups) for 10-50%, preferably 15-40% of the hydroxyl groups in a weight proportion of from 5:95 to 50:50, preferably 10:90 to 30:70 (column 4, lines 40-67). The alkali soluble resin should have a molecular weight (weight-averaged) in the range of 2,000 to 20,000, and the molecular weight distribution thereof should be as narrow as possible from the standpoint of obtaining a resist layer having good heat resistance and high pattern resolution. The molecular weight distribution represented by the ratio of the weight-averaged molecular weight to the number-averaged molecular weight should not

exceed 3.5, or preferably 2.5 for the polyhydroxystyrene-based resin (column 5, lines 35-63). Although the references fails to disclose the molecular weight dispersion as claimed in the present claim 6, given that the reference utilizes an almost identical polyhydroxystyrene component, it is the position of the examiner that the component resin of the reference would inherently meet the present claim limitations for the molecular weight dispersion. The resist composition is preferably employed in a method of producing a semiconductor device like that disclosed in the preamble of the independent claim including the steps of dissolving the resist in a solvent, coating the solution onto a substrate, drying the solution to form a photosensitive layer, exposing the layer to radiation, developing the exposed resist to form the resist pattern, and then subjecting the pattern to a post-baking process (column 14, line 54 to column 15, line 44). Example 1 in column 20 utilizes a positive-working photoresist composition comprised of 30 parts by weight of a first polyhydroxystyrene resin having a weight-averaged molecular weight of 10,000 substituted with tert-butyloxycarbonyl groups for 39% of the hydroxyl groups, and 70 parts by weight of a second polyhydroxystyrene resin having a weight-averaged molecular weight of 10,000 substituted by ethoxyethyl groups for 39% of the hydroxyl groups, which is almost identical to the preferred resin of the present specification. According to the examples, the developer preferably employed is a solution of 2.38% by weight of tetramethylammoniumhydroxide (TMAH) for 60 seconds at a temperature of 23 $^{\circ}$ C. The resultant photoresist had the high thickness retention of 98% (see Table 1).

On page 6 of the instant specification, it is stated that the particular preference for the preferred combination of certain resinous compounds is based on the discovery that the requirement for the rate of the film thickness retention "can be complied with relatively easily by

using a mixture of these two resinous compounds" (referring to their disclosure of the two preferred resins), meaning that the rate is dependent upon the type of resin employed in the photoresist composition. Given this statement and the exemplified resins of the inventive examples of the instant specification, it can be determined that resins which are quite similar to these will inherently meet the present claim limitations. Although Nitta et al does not specifically disclose the claimed rate, the inventive samples of the reference are nearly identical to those of the instant specification (the only differences are that the molecular weights of the reference resins are slightly higher as well as the percentage of hydroxyl groups substituted, but there is only a slight difference, and the molecular weight and the percentages still fall well within the scope of the description on page 6 of the instant specification for the preferred resins) and that film thickness retention is a goal of the invention of the reference, it is the position of the examiner that when made, the photoresist composition of the reference would inherently meet the present claim limitations for the rate of the reduction of thickness.

With respect to the limitation of the present claim 1 which requires that the "photoresist composition of which a layer before the pattern-wise light exposure exhibits a reduction of thickness at 23 $^{\circ}$ C in a 2.38% by weight aqueous solution of TMAH at a rate in the range from 0.15 to 0.2 nm/second", the examiner notes that the claim does not actually require a method step wherein the resist is developed in this manner, but instead requires that the resist composition would exhibit the claimed reduction of thickness *when subjected* to the aforementioned conditions.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-7 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 9-20 of copending Application No. 09/939842. Although the conflicting claims are not identical, they are not patentably distinct from each other because the co-pending application claims a method for the preparation of a semiconductor device by forming a patterned resist layer on the surface of a substrate by pattern-wise light-exposure of a photoresist layer of a chemical-amplification positive-working photoresist composition comprising (A) a compound capable of generating an acid by irradiation with actinic rays and (B) a resinous compound capable of being imparted with increased solubility in an aqueous alkaline solution in the presence of an acid, the improvement which comprises decreasing the number of defects in the patterned resist layer by using a photoresist composition of which a layer before the pattern-wise light-exposure exhibits reduction of thickness at 23.degree. C. in a 2.38% by weight aqueous solution of tetramethylammonium hydroxide at a rate in the range from 0.09 to 1.0 nm/second wherein the resinous compound as the component (B) of the photoresist composition is a copolymeric resin (B-2) comprising monomeric units of acrylic acid or methacrylic acid substituted by tertiary

alkyl groups for the hydrogen atoms of the carboxyl groups and monomeric units of hydroxystyrene or a-methyl hydroxystyrene.

Given the teachings of Maemori et al (09/939842) which fully encompass the instant claims, it would have been obvious to one of ordinary skill in the art to prepare a semicondutor device employing the method of the instant claims 1-7.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

10. Applicant's arguments filed 10/6/2003 (with the filing of this application) have been fully considered but they are not persuasive.

In the remarks filed with the preliminary amendment, applicant stated that the narrowed range of the film thickness reduction of this application avoids the rejection of claim 1 over Nitta et al, which was cited in the parent application. Furthermore, in light of the narrowed range in the instant claims, the instant claims should now be allowable as the applicant "calculated the rate of film thickness reduction in the examples of Nitta to obtain a value of 0.23 nm/second assuming a film thickness retention of 98% (table 1) and other numerical values disclosed in the examples of Nitta et al.

With respect to this statement, firstly there are 9 inventive examples in the Nitta et al reference. Applicant has not set forth which examples were calculated, therefore it is unclear as to whether all of the examples were tested and found to have that rate, or whether one or a few selected examples were calculated and were found to have that rate. Secondly, applicant's

arguments cannot take the place of evidence. Since applicant is arguing the inoperability of the prior art, the argument will not be considered by the examiner at this time as this type of objective evidence must be factually supported by an affidavit or declaration as set forth in the MPEP section 716.01 (c).

716.01(c) Probative Value of Objective Evidence

TO BE OF PROBATIVE VALUE, ANY OBJECTIVE EVIDENCE SHOULD BE SUPPORTED BY ACTUAL PROOF

Objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant. See, for example, In re De Blauwe, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984) ("It is well settled that unexpected results must be established by factual evidence." "[A]ppellants have not presented any experimental data showing that prior heat-shrinkable articles split. Due to the absence of tests comparing appellant's heat shrinkable articles with those of the closest prior art, we conclude that appellant's assertions of unexpected results constitute mere argument."). See also In re Lindner, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972); Ex parte George, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991).

ATTORNEY ARGUMENTS CANNOT TAKE THE PLACE OF EVIDENCE

The arguments of counsel cannot take the place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). Examples of attorney

statements which are not evidence and which must be supported by an appropriate affidavit or declaration include statements regarding unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant.

See MPEP § 2145 generally for case law pertinent to the consideration of applicant's rebuttal arguments.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hirano et al (2004/0023147), Numata et al (6,623,907), Oberlander et al (2003/0129531), Adams et al (2004/0002017), and Hamada et al (2004/0033438) are cited for their teachings of photoresists comprising similar resins.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda C Walke whose telephone number is 571-272-1337. The examiner can normally be reached on M-R 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Amanda C Walke
Examiner
Art Unit 1752

ACW
February 25, 2004